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10/675,014	09/30/2003	Randy J. Longsdorf	R11.12-0789	4855

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WESTMAN CHAMPLIN & KELLY, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402-3319

EXAMINER	
KASENGE, CHARLES R	
ART UNIT	PAPER NUMBER
2125	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/675,014	LONGSDORF ET AL.	
	Examiner	Art Unit	
	Charles R. Kasenge	2125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-32 and 34-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-32 and 34-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 2 and 33 is withdrawn in further review of Eryurek et al. U.S. Patent 6,017,143. Rejections based on the reference(s) follow.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-6, 10-26, 28-32, 34-36 and 39-56 are rejected under 35 U.S.C. 102(b) as being anticipated by Eryurek et al. U.S. Patent 6,017,143. Referring to claims 1 and 32, Eryurek discloses an apparatus for use in an industrial process control or monitoring system, comprising: a process device for coupling to a process (Fig. 2, #40; col. 3, lines 36-41) which includes a process transmitter (Fig. 1, #8 and col. 3, line 1) or controller (Fig. 1, #10 and col. 3, lines 1) to monitor or control the industrial process and communicate; col. 3, lines 34-36); a process coupling configured to couple the process device to a process which includes piping carrying a process fluid, the process coupling configured to receive vibrations from the process (Fig. 1, #4; col. 2, lines 23-35 and 66-67); a vibration sensor configured to receive vibrations from the process which are transferred from the process through the process coupling and to sense vibrations and provide a sensed vibration signal (Fig. 1 and 2, #16; col. 2, lines 23-35; col. 3, lines 9-15; col. 4, lines 1-4; col. 13, lines 50-54); and diagnostic circuitry (Fig. 5, #102 and col.

8-9, lines 30-14) located in the process device configured to receive the sensed vibration signal and responsively provide a diagnostic output related to a process disturbance or operation of a process component (Fig. 5 and col. 8, lines 50-52); and wherein the process device includes a process variable sensor separate from the vibration sensor configured to sense a process variable (col. 8 and 9, lines 29-3). Eryurek does not disclose multiple sensors in Figs. 1 and 2, however Eryurek states the "Inference engine resides in (the) **process device**... and receives **process variables** (col. 8, lines 31-32)." Eryurek further states "the inference engine further analyzes the various inputs... such as a valve motor, pump, **vibration** equipment, etc. by running appropriate diagnostics (col. 8, lines 58-63)" and the "diagnostics... may also observe information being received from... upstream or downstream **sensors**... (col. 8 and 9, lines 66-3)." Therefore, Eryurek does teach an alternate configuration that monitors vibrations and other process variables with multiple sensors.

Referring to claims 3-6 and 34-36, Eryurek discloses the apparatus of claim 1 wherein the process device includes a process variable sensor for sensing a process variable (col. 4, lines 1-4). Eryurek discloses the apparatus of claim 1 wherein the process device includes a control element configured to control operation of the process (col. 3, lines 9-15 and 36-41). Eryurek discloses the apparatus of claim 1 wherein the process device includes an input configured to receive a process signal (col. 1, lines 44-45). Eryurek the apparatus of claim 1 wherein the process device includes output circuitry including communication circuitry configured to couple to a two-wire process control loop (col. 1, lines 56-57 and col. 13, lines 22-23). Eryurek discloses the apparatus of claim 1 wherein the vibrations are carried through process components (col. 4, lines 1-4).

Referring to claims 10-15 and 39-42, Eryurek discloses the apparatus of claim 1 wherein the output from the diagnostic circuitry is transmitted on a process control loop (col. 2, lines 41-45). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is related to failure of a process component (col. 10, lines 20-28). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is related to degradation in performance of a process component (col. 10, lines 28-31). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is related to an impending failure of a process component (col. 10, lines 28-31). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is based upon a comparison of sensed vibrations to a base line level (col. 12, lines 31-37). Eryurek discloses the apparatus of claim 14 wherein the base line level is determined based upon history of the process (col. 8, lines 29-41).

Referring to claims 16-21 and 43-49, Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is based upon an accumulation of sensed vibrations (col. 12, lines 31-37). Eryurek discloses the apparatus of claim 16 wherein the diagnostic output is based upon a comparison of accumulated vibrations to a threshold (col. 12, lines 31-37). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is based upon trends in the sensed vibrations (col. 10 and 11, lines 62-4). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is used to adjust a control algorithm (col. 2, lines 30-35). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is used to compensate a process variable measurement (col. 4, lines 5-9). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is based upon a frequency spectrum of the sensed vibrations (col. 2, line 52).

Referring to claims 22-26 and 50-53, Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is based upon rules (col. 1, lines 49-64). Eryurek discloses the apparatus of

claim 1 wherein the diagnostic circuitry implements a neural network (col. 9, lines 3-5). Eryurek discloses the apparatus of claim 1 wherein the diagnostic circuitry implements fuzzy logic (col. 9, lines 3-5). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is based upon sensed spikes in the vibration signal (col. 1, lines 59-64). Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is based upon a rolling average of the vibration signal (col. 7 and 8, lines 66-1).

Referring to claims 28-31 and 53-55, Eryurek discloses the apparatus of claim 1 wherein the diagnostic output is correlated with process operation (col. 2, lines 41-45). Eryurek discloses the apparatus of claim 1 including a plurality of process devices configured to sense vibrations (col. 4, lines 1-4). Eryurek discloses the apparatus of claim 1 wherein the process device is completely powered from a process control loop (col. 4, lines 29-35). Eryurek discloses the apparatus of claim 1 wherein the process device is configured to couple to a process control loop selected from the group of process control loops consisting of two, three and four wire process control loops (col. 2, line 67). Eryurek discloses the apparatus of claim 1 wherein the vibration sensor senses vibration in the process received through a mounting arrangement (Fig. 1, #16) or a wiring system (Fig. 1, #6, 16).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 7-9, 27, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eryurek et al. U.S. Patent 6,017,143 as applied to claims above, and further in view of Bellet et al. U.S. Patent 5,796,006. Eryurek does not disclose the vibration sensor comprising an accelerometer, configured to sense vibrations along one or more than one axis, and be a piezoelectric sensor. Regarding claims 7-9, 37 and 38, Bellet discloses the apparatus of claim 1 wherein the vibration sensor comprises an accelerometer (col. 4, lines 31-52). Bellet discloses the apparatus of claim 1 wherein the vibration sensor is configured to sense vibrations along one axis (col. 2, lines 33-38). Bellet discloses the apparatus of claim 1 wherein the vibration sensor is configured to sense vibrations along more than one axis (col. 6, lines 33-46). Regarding claim 27, Bellet discloses the apparatus of claim 1 wherein the vibration sensor is selected from a group of vibration sensors including of capacitive, electrodynamic, piezoelectric and Micro-Electro-Mechanical Systems (MEMS) (col. 4, lines 31-52).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have a vibration sensor comprising an accelerometer, configured to sense vibrations along one or more than one axis, and be a piezoelectric sensor. One of ordinary skill in the art would have been motivated to do this since they are commonly used in an industrial process control system (abstract).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles R. Kasenge whose telephone number is 571 272-3743. The examiner can normally be reached on Monday through Friday, 8:30 - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CK
December 28, 2007

PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100